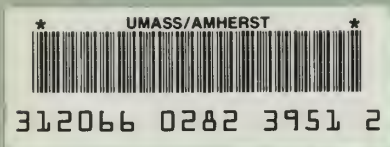


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Berkshire Medical Center Description of Injury Discharges



Massachusetts Department of Public Health
Statewide Comprehensive Injury Prevention Program

October 1991

914/429

Berkshire Medical Center Description of Injury Discharges

**Statewide Comprehensive Injury Prevention Program
Bureau of Parent, Child and Adolescent Health
Massachusetts Department of Public Health
150 Tremont Street, Boston, MA 02111**

October 1991

William F. Weld, Governor
David P. Forsberg, Secretary of Health and Human Services
David H. Mulligan, Commissioner of Public Health
Deborah Klein Walker, Assistant Commissioner

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Disabilities Prevention Program
Centers for Disease Control
in cooperation with
Office of Disability Prevention
Massachusetts Department of Public Health

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Introduction

Injuries, both unintentional and intentional, are a leading public health problem in Massachusetts and in the other 49 states. More young people die from injuries than from any other cause, and older people are hospitalized for injuries at the highest rate of any age group. Most injuries can be prevented or reduced in severity through strategies that combine education, regulation, and technology.

This report on injury discharges from Berkshire Medical Center is the third in a series developed by the Statewide Comprehensive Injury Prevention Program (SCIPP) with funding received from the Office of Disability Prevention. The purpose of the series is to show how hospital discharge data can be used to identify and describe injury problems in different communities.

The primary goal of SCIPP is the reduction of injuries among Massachusetts citizens. This goal is met by improving existing data sources, by developing strategies and training materials to help integrate injury prevention into ongoing public health services, by coordinating injury prevention efforts, by disseminating information, and by researching the causes of injuries. The Office of Disability Prevention (ODP) is also involved in planning injury prevention programs.

Accurate and comprehensive data about injuries are needed to develop and improve prevention strategies, to target high-risk groups, and to evaluate the effectiveness of injury prevention methods. In Massachusetts, for every injury death in 1988 there were about 19 injuries serious enough to warrant hospital admission. The Uniform Hospital Discharge Data Set (UHDDS) compiled by the Massachusetts Rate Setting Commission is an important source of demographic, clinical, and financial data about injured people who have required admission to acute care hospitals. Hospital discharge data include many fatal and most serious nonfatal injuries and provide a broader picture of injuries than death data alone. However, a crucial item, the external cause of injury code (E code) which describes how the injury occurred, is not required for reimbursement, and only a minority of discharge records are E-coded.

Berkshire Medical Center has been diligent in coding the external cause of injury for the majority of its discharges included in the most recently available discharge data. Therefore, we have selected its discharges for further analysis to demonstrate the value of external cause coding. The focus of the report will be on the three leading causes of injury (falls, motor-vehicle occupant, and self-inflicted injuries) for people admitted to Berkshire Medical Center from October 1986 through September 1988.

Berkshire Medical Center

Berkshire Medical Center is a 369-bed general hospital located in Pittsfield, Massachusetts within Berkshire County, and is accredited by the Joint Commission on Accreditation of Health Care Organizations.

In 1987, Berkshire County had an estimated population¹ of 141,700 composed of 52.9% females and 47.1% males. The proportions of people in the various age ranges generally were similar to the statewide proportions.

External Cause of Injury Coding

E codes are the external cause of injury codes (E800-999) developed as part of the International Classification of Diseases (ICD-9-CM)² (Appendix A). They are used primarily in conjunction with ICD-9-CM codes 800-999³ that describe the clinical nature of the injury and body part affected (Appendix B). E codes classify the environmental events, circumstances, intent, and conditions that cause injury, poisoning, and other adverse effects (e.g., E885, fall on same level from slipping, tripping, or stumbling). Secondary E codes are useful in identifying the place of occurrence of an injury (e.g., E849.0, home), or in specifying a cause secondary to the primary cause (e.g., E936.1, fall precipitated by adverse drug reaction).

Together, analysis of both diagnosis codes and E codes can tell us a great deal about how, when, where, and why people get injured. Some of the questions that can be answered include:

- Who is injured?

- How are these people injured?

- Where do these injuries take place?

- How many of the injuries have occurred, and over what period of time?

- How do local injury rates compare with the national and state rates?

"E-coded hospital discharge data (HDD) systems are potentially one of the most practical and cost-effective means available to collect the data needed to prevent and control injuries. The addition of E codes to HDD systems increases their practical utility to address a major public health problem and obviates the need to establish new data collection systems."⁴

¹ Population estimates were produced by Robert Danley, Bureau of Health Statistics, Research and Evaluation using 1980 Census data and 1990 projected figures developed by MISER (Massachusetts Institute for Social and Economic Research).

² International Classification of Diseases, 9th Revision, Clinical Modification. Ann Arbor, MI: Commission on Professional and Hospital Activities, 1986.

³ The following codes are excluded from the analysis of injuries: late effects (905-909), complications of care (996-999), and codes below 800.

⁴ Snizek J, Finklea J, Graitcer P. Injury coding and hospital discharge data. JAMA 1989; 262:2272.

Data Set

A data set was created by combining all discharges from Berkshire Medical Center during FY 1987 and FY 1988 (October 1, 1986 to September 30, 1988) submitted to the Rate Setting Commission. The data set was created to describe the hospital's inpatient injury caseload with emphasis on the leading causes of injury based on the demographic, clinical, and financial information available in the UHDDS. It does not include records of people who died without being admitted nor does it include data on deaths or continued cost of care after discharge. It does include readmissions for additional treatment of a previous injury.

The primary focus is the 1,849 E-coded injury discharges with ICD-9-CM codes in the 800-904 and 910-995 ranges. These injuries accounted for 7.3% of the 25,406 total discharges, 7.8% of the \$112,193,276 in hospital charges, and 7.3% of the 177,512 hospital days. Injuries potentially could account for substantially higher proportions of discharges, charges, and days if non-E-coded injury discharges, injury diagnoses that are secondary, and E-coded discharges with principal diagnoses below 800 were included in this analysis.

In the analysis that follows, comparisons of length of stay and total charges will use median values that represent the middle value of each distribution, above and below which lie an equal number of values. Because of the presence of some extreme values that skew the distributions, comparisons using mean values are less appropriate.

Table 1
Discharge Data for Berkshire Medical Center
(October 1, 1986 to September 30, 1988)

Discharges	#	%	Charges (\$)	%	Days	%
Injuries*	2,229	8.8	11,505,403	10.3	16,071	9.1
E Code	1,849	7.3	8,760,457	7.8	12,977	7.3
No E Code	380	1.5	2,744,946	2.4	3,094	1.7
Other**	22,819	89.8	98,462,726	87.8	158,956	89.5
Total*	25,406	100.0	112,193,276	100.0	177,512	100.0

* Principal diagnoses of late effects (905-909) and complications of care (996-999) are excluded from injuries (800-999) but included in total discharges.

** Principal diagnoses below 800.

Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.

Overview of Injury⁵ and Other⁶ Discharges

- Discharges of people admitted with injuries represented 8.8% of all discharges (2,229).
- Injuries accounted for \$11,505,403 in charges or 10.3% of all hospital charges.
- The median charge for injury discharges was \$2,646 as compared to \$2,289 for other discharges.
- Injuries accounted for 16,071 days of care or 9.1% of all hospital days.
- The median length of stay for injury discharges was three days as compared to four days for other discharges.
- Among injury discharges, 4.3% incurred charges of \$20,000 or more as compared to 2.7% of other discharges.
- Medicare and Medicaid were the principal sources of payment for more than a quarter of injury (22.3%, 6.0%) and two-fifths of other discharges (31.9%, 8.6%).
- A higher percentage of injury (15.9%) than of other (10.5%) discharges involved out-of-state residents.
- The most common Massachusetts towns of residence for injury and other discharges were similar: Pittsfield (44.2%, 48.4%), Dalton (5.6%, 6.0%), Lee (5.5%, 5.7%), and Lenox (5.2%, 5.0%).

⁵ Codes 800-904 and 910-995 with and without E codes.

⁶ Codes below 800.

Description of Injury Discharges by External Cause of Injury

More than four-fifths (83.0%) of injury discharge records (1,849) included the external cause of injury (E code). More than a third of E-coded injuries were fall-related, a quarter were vehicle-related⁷, and almost ten percent were intentional⁸. Discharges for the three most frequent external causes of injury will be described in detail.

Table 2
External Cause of Injury for Discharges from Berkshire Medical Center

Cause	Total #	Total %	# Female	# Male
Falls	675	36.5	389	286
Motor-vehicle occupant	268	14.5	103	165
Self-inflicted	134	7.3	81	53
Cutting/piercing	99	5.4	20	79
Struck by object	72	3.9	12	60
Poisoning	45	2.4	17	28
Assault-related	45	2.4	5	40
Motorcycle	44	2.4	4	40
Other transportation	41	2.2	25	16
Pedal cycle	40	2.2	9	31
Off-road motor-vehicle	36	2.0	6	30
Motor vehicle/pedestrian	35	1.9	14	21
Overexertion	32	1.7	17	15
Adverse drug reaction	30	1.6	20	10
Fire	25	1.4	8	17
Environmental/radiation	24	1.3	12	12
Machine in operation	22	1.2	5	17
All other causes	182	9.8	65	117
All E-coded causes	1,849	100.0	812	1,037

Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.

Note: Percents do not total 100.0 due to rounding.

⁷ Includes motor-vehicle occupant, pedestrian, other transportation, pedal cycle, motorcycle, and off-road motor-vehicle injuries.

⁸ Includes self-inflicted and assault-related injuries.

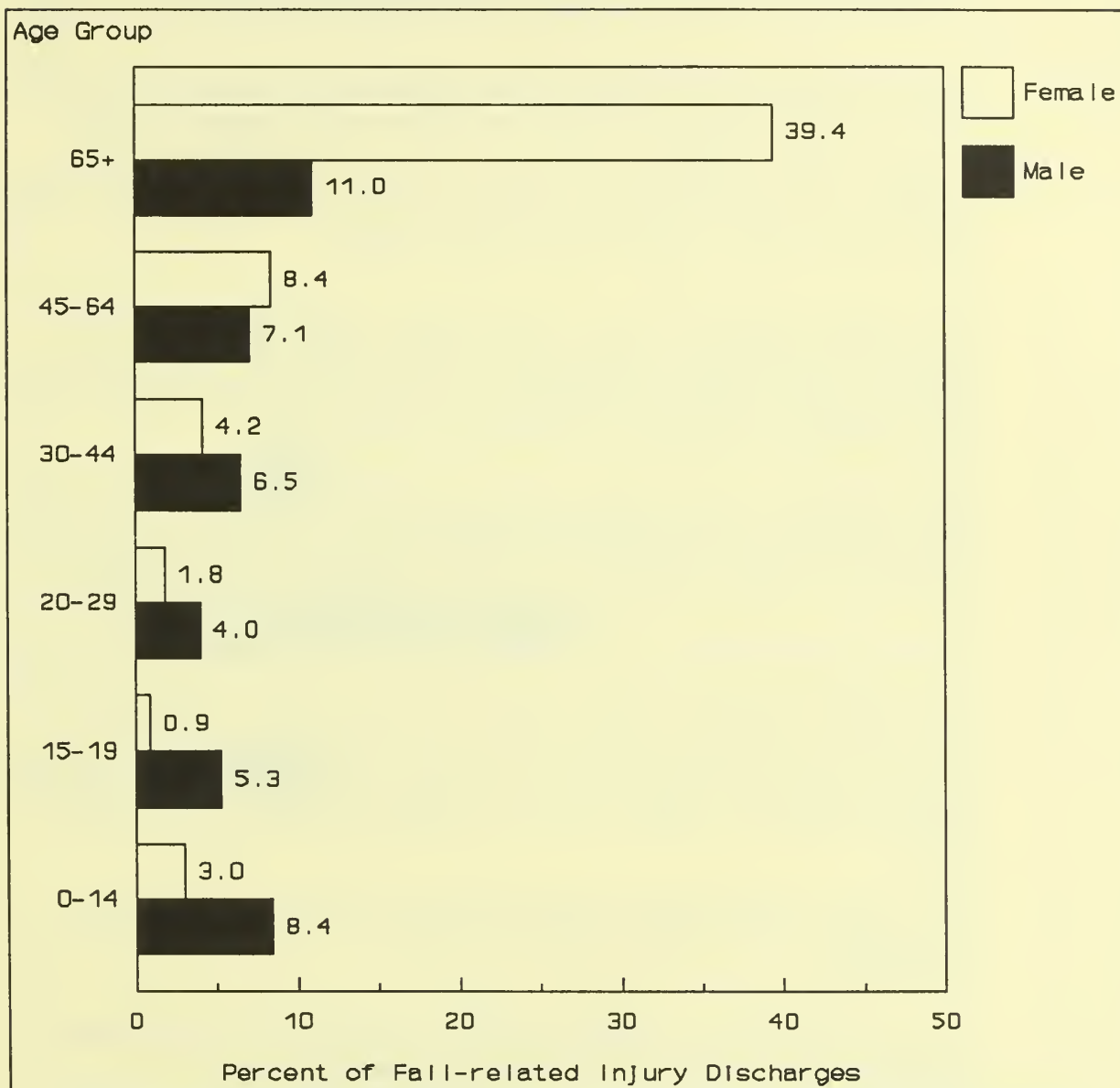
Falls

Falls were the leading cause of injury hospitalization, accounting for 675 admissions during the study period.

- Falls accounted for more than a third (36.5%) of E-coded injury discharges. Falls are the leading cause of injury-related hospital admissions in the United States and in Massachusetts, representing an estimated one-third of discharges for nonfatal injuries.
- Half (50.4%) of fall-related discharges involved people 65 years old and older. In general, the elderly are at higher risk of both dying and being hospitalized as the result of a fall as compared to younger people who experience falls (Figure 1).
- More than a third (34.4%) of fall-related injury discharges among the elderly involved people 85 years old and older.
- Falls accounted for the largest proportion of discharges within four age groups: 0-14 (29.5%), 30-44 (23.9%), 45-64 (46.3%) and 65+ (70.1%).
- Within each age group under the age of 45, more males than females were admitted due to a fall; over the age of 44, more females than males were admitted, especially in the 65+ group (78.2%).
- Patients admitted for fall-related injuries incurred 44.3% of hospital charges for E-coded injury discharges. The median charge for a fall-related discharge was \$3,688 as compared to \$2,574 for all causes of injury. However, the average daily charge (\$584) was lower than the average for all other injury causes (\$771).
- The median length of stay was five days in contrast to three days for all causes of injury.
- Twenty-one of the 28 deaths included in the injury data set occurred among people hospitalized for fall-related injuries.
- A sixth (16.4%) of patients hospitalized for falls were out-of-state residents.

- Two-thirds of fall-related injuries resulted in fractures of various body parts: femur (25.6%), lower limb (18.2%), neck/trunk - no spinal cord injury (12.4%), upper limb (11.6%), and facial (0.6%). A sixth of the patients sustained head injuries, mainly concussions.

Figure 1
Distribution of Fall-related Injury Discharges from Berkshire Medical Center
by Age Group and Sex



Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.

Note: Number of fall-related injury discharges (total=675, female=389, male=296).

Motor-vehicle Occupant Injuries

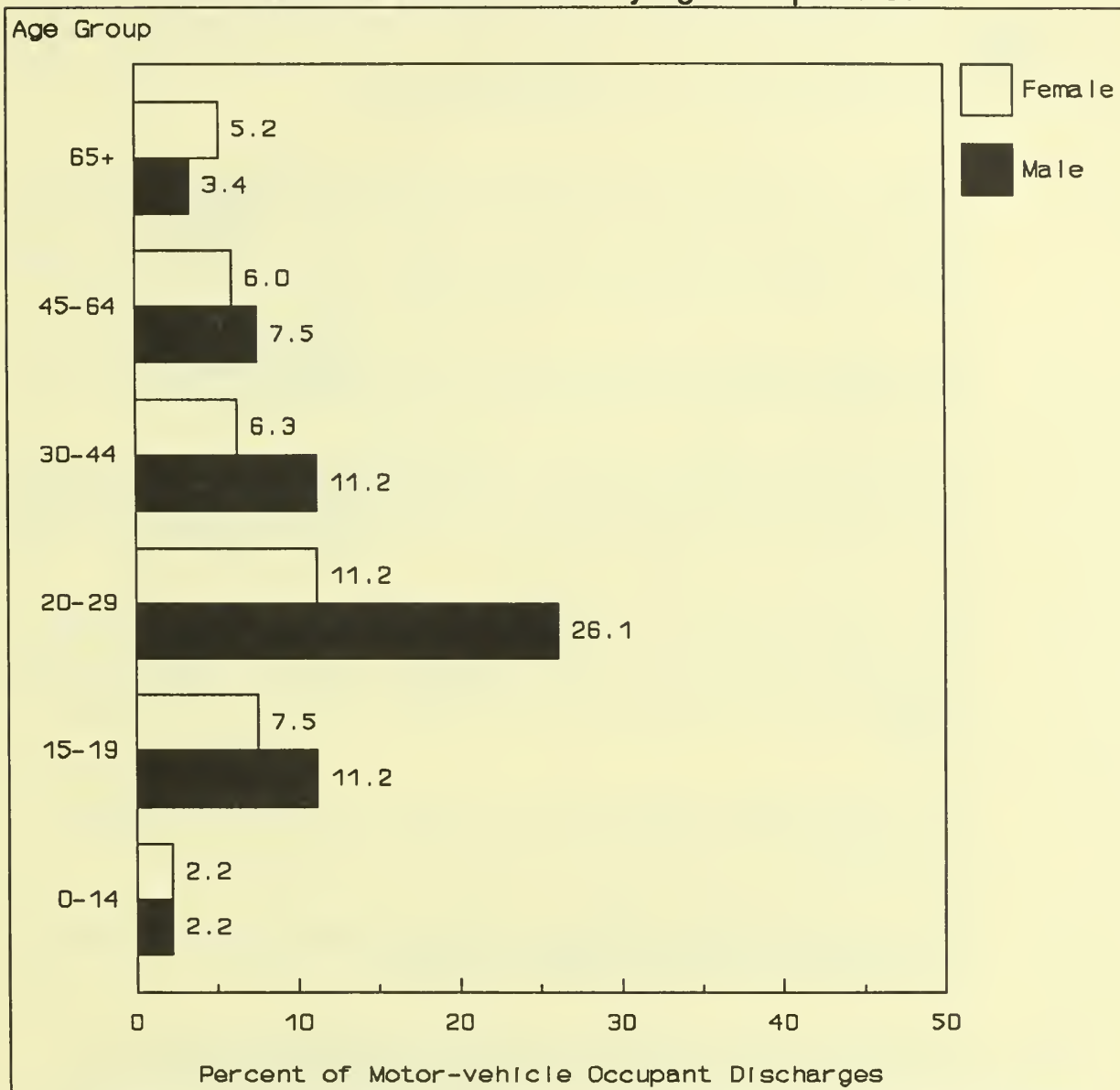
Motor-vehicle occupant injuries were the second leading cause of injury hospitalization, accounting for 268 admissions during the study period.

- Motor-vehicle occupant injuries accounted for 14.5% of E-coded injury discharges. Injuries to motor-vehicle occupants also comprised the second leading cause of injury hospitalization in the United States and among a selected group of acute care hospitals in Massachusetts, accounting for 10.5% of nonfatal, E-coded injury discharges in FY 1985⁹.
- Almost half (45.9%) of motor-vehicle occupant injuries were the result of collisions on the highway, mainly with other motor vehicles (31.0%); almost a fifth (18.3%) involved loss of control on the highway without collision; a third (34.0%) were caused by traffic crashes of an unspecified nature; and a few (1.9%) were not traffic-related.
- More than a third (37.3%) of motor-vehicle occupant injuries involved young adults (20-29); almost a fifth (18.7%) were adolescents; and almost a fifth (17.5%) were between 30 and 44 years old (Figure 2). This age distribution is similar to national and state patterns.
- Motor-vehicle occupant injuries accounted for the largest proportion of injury discharges for adolescents (23.0%) and young adults (27.9%) and the second largest proportion for all other adult age groups (Table 3).
- Males predominated (61.6%), especially between the ages of 15 and 64.
- The median charge for motor-vehicle occupant injuries was \$2,051 as compared to \$2,574 for all injury discharges. However, the average daily charge (\$886) was higher than the average for all other injury causes (\$645).
- The median length of stay was three days, the same as for all injury discharges.
- Two of the 28 deaths included in the injury data set occurred among people hospitalized for motor-vehicle occupant injuries.

⁹ This group of 31 hospitals accounted for most of the discharges with E codes in the Uniform Hospital Discharge Data Set.

- More than a fifth (22.4%) of the patients hospitalized for these injuries were out-of-state residents.
- The most common principal diagnoses were: concussion (31.3%), internal injury (13.2%), neck/trunk - no spinal cord injury (12.1%), intracranial - no fracture (7.9%), and open wounds (7.1%).

Figure 2
Distribution of Motor-vehicle Occupant Injury Discharges
from Berkshire Medical Center by Age Group and Sex



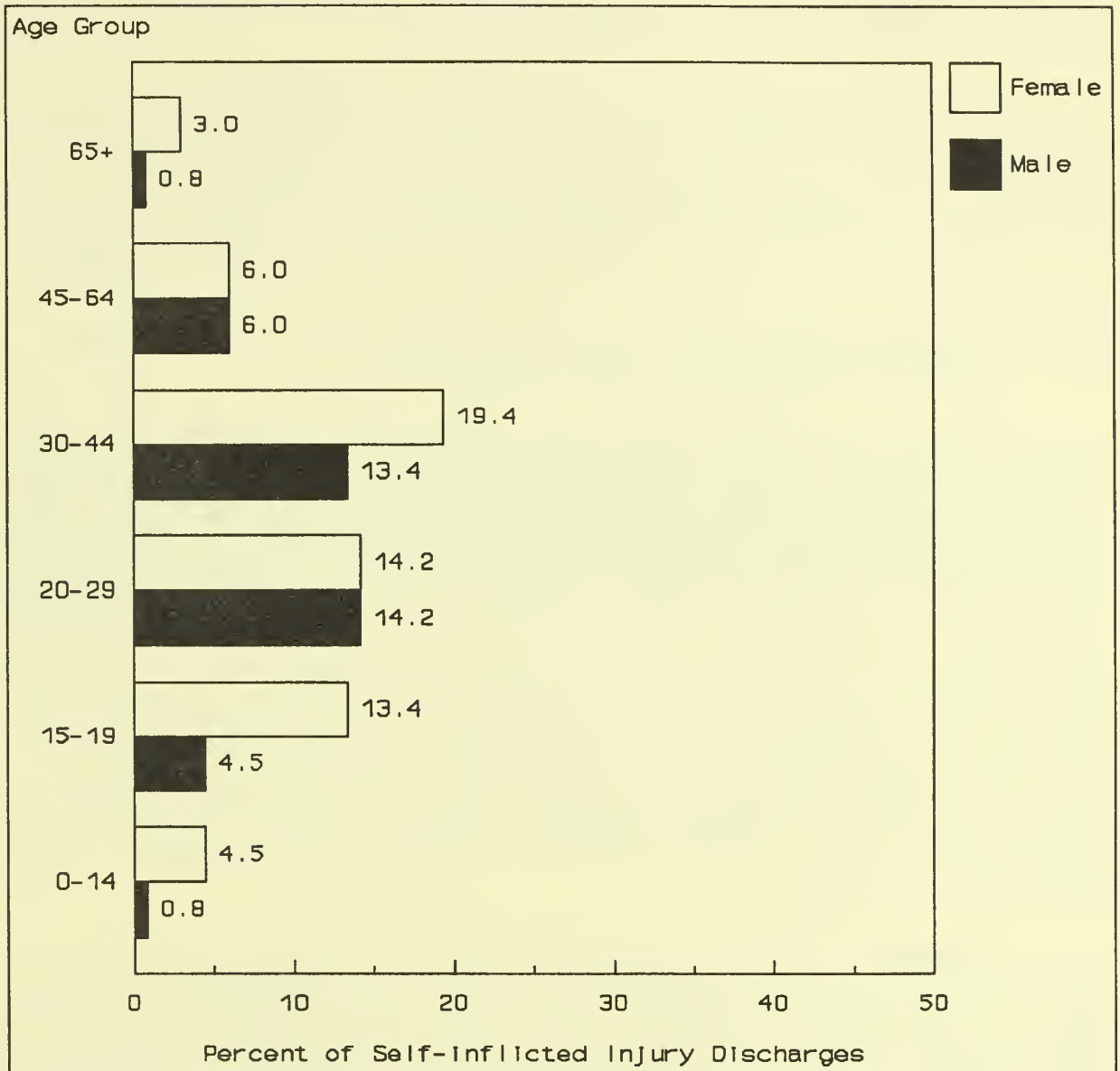
Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.
 Note: Number of motor-vehicle occupant injury discharges (total=268, female=103, male=165).

Self-inflicted Injuries

Self-inflicted injuries were the third leading cause of injury hospitalization, accounting for 134 admissions during the study period.

- Self-inflicted injuries accounted for 7.2% of E-coded injury discharges. Among a selected group of acute care hospitals in Massachusetts, self-inflicted injuries were the fourth leading cause of injury-related hospitalizations, accounting for 8.5% of nonfatal, E-coded discharges in FY 1985. Because intent can be difficult to determine, the proportion of these injuries is probably higher than indicated by E codes. Intent could not be determined for 16 cases of injury by poisoning (11), firearm (1), cutting/piercing (3), and unspecified means (1).
- Almost a third (32.8%) of self-inflicted injuries involved people between 30 and 44 years of age; the second most common age group was young adults between 20 and 29 years old, accounting for more than a quarter (28.4%); more than a sixth (17.9%) involved adolescents (Figure 3).
- Self-inflicted injuries accounted for the third largest proportion of injury discharges for all age groups between 15 and 64 (Table 3).
- Females predominated (60.5%), especially under the age of 20, but also in the 30-44 and 65+ age groups. It should be noted that males comprise the majority of completed suicides.
- The median charge for self-inflicted injury discharges was \$2,711 as compared to \$2,574 for all injury discharges. However, the average daily charge (\$576) was lower than the average for all other injury causes (\$686).
- The median length of stay was three days, the same as for all injury discharges.
- None of the 28 deaths included in the injury data set occurred among people hospitalized for self-inflicted injuries.
- A seventh (14.2%) of these patients were out-of-state residents.
- Most (90.3%) self-inflicted injury discharges had a principal diagnosis of poisoning or toxic effects.

Figure 3
Distribution of Self-inflicted Injury Discharges from Berkshire Medical Center
by Age Group and Sex



Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set, FY 1987-88.
 Note: Number of self-inflicted injury discharges (total=134, female=81, male=53).

Conclusion

This description of injury discharges from Berkshire Medical Center for FY 1987 and FY 1988 was possible because the hospital's medical records department coded the external cause for most of the injuries treated. By analyzing E codes in conjunction with the demographic, clinical, and financial data from hospital discharge records, we have provided a potential basis for targeting specific causes and age groups for injury prevention efforts in the hospital's primary service area.

Falls among the elderly, a priority injury in this analysis, could be reduced through the use of home safety devices and education about safety habits offered by senior citizen centers, nursing homes, social service agencies, Visiting Nurse Associations, and a variety of public and private health care providers. The Statewide Comprehensive Injury Prevention Program and the Office of Disability Prevention could provide training and materials on injury prevention for the elderly. The effectiveness of any injury prevention activities conducted then could be assessed by examining hospital discharge data in the following years.

This analysis also underscores the problem of motor-vehicle occupant injuries, especially among young people. Occupant protection through the use of safety belts, child safety seats, and air bags is a strategy demonstrated to be effective in reducing the frequency and severity of motor-vehicle occupant injuries. Additional reinforcement of safety behaviors through education, enforcement, and legislation are needed. In Massachusetts, the occupant protection law only covers children 12 years of age and under. Many motor-vehicle occupant injuries, fatal and nonfatal, result from driving while intoxicated. License suspension and enforcement of minimum legal drinking age laws have proven effective in reducing motor-vehicle crashes. Further evaluation of strategies that target teenage drivers is needed (e.g., increasing age of licensure, curfew laws, and driver education). The Massachusetts Passenger Safety Program (MPSP) is a resource for technical assistance, education, materials, program development, and training.

The data also indicate the need for prevention of self-inflicted injuries. The people treated (inpatient or outpatient) for unsuccessful suicide attempts are especially at-risk for future, possibly successful, suicide attempts. While there are a variety of suicide prevention interventions that are promising, their effectiveness needs to be evaluated. The reduction in the availability of the means of suicide may deter some people (e.g., gun control and limitation on prescriptions of potentially lethal medications). Identification and treatment of those who attempt or are at-risk for suicide are also among the promising interventions (e.g., screening by health care and

social service providers, crisis intervention services, school-based programs, and employee assistance programs).

In conclusion, "the universal use of E codes in hospital discharge data is one of the most important goals for the injury prevention community. Consistent use of E codes would provide an extremely valuable resource for the study of injury rates and patterns. Injury control practitioners would be able to use this information to obtain a much more accurate view of a local injury problem. It would also allow much more thorough aggregation of injury morbidity data as well as comparisons of the data at the local, state, and national levels and among specialized studies."¹⁰ In addition, coding at the most specific level possible from available documentation is needed (e.g., maximum use of fourth digits and minimum use of codes for other and unspecified).

Other benefits of improved injury data include: documentation of known problems (e.g., near-drownings), identification of new hazards (e.g., all-terrain vehicles), evaluation of the effectiveness of prevention strategies (e.g., reduction of poisonings due to childproof packaging), determination of the cost of various causes of nonfatal injuries to be better able to focus scarce resources to obtain the greatest benefit, formulation of local and state goals and objectives based on empirical findings, improvement in diagnosing and treating injured patients, and hospital marketing activities.

¹⁰ National Committee for Injury Prevention and Control. Injury prevention: meeting the challenge. New York: Oxford University Press, 1989: Am J Prev Med, Suppl: 5(3): 45.

Table 3
Leading Causes of Injury Discharges from Berkshire Medical Center by Age Group and Sex

Cause: Total	#	%	Cause: Female	#	%	Cause: Male	#	%
0-14 years:								
Falls	77	29.5	Falls	20	21.1	Falls	57	34.3
Poisoning	28	10.7	Poisoning	13	13.7	Pedal cycle	16	9.6
Pedal cycle	22	8.4				Poisoning	15	9.0
All other causes	134	51.3	All other causes	62	65.3	All other causes	78	47.0
All causes	261	100.0	All causes	95	100.0	All causes	166	100.0
15-19 years:								
Motor-vehicle occupant	50	23.0	Motor-vehicle occupant	20	29.0	Falls	36	24.3
Falls	42	19.4	Self-inflicted	18	26.1	Motor-vehicle occupant	30	20.3
Self-inflicted	24	11.1	Falls	6	8.7	Cutting/piercing	11	7.4
			Other transportation	6	8.7			
All other causes	101	46.5	All other causes	19	27.5	All other causes	71	48.0
All causes	217	100.0	All causes	69	100.0	All causes	148	100.0
20-29 years:								
Motor-vehicle occupant	100	27.9	Motor-vehicle occupant	30	33.0	Motor-vehicle occupant	70	26.2
Falls	39	10.9	Self-inflicted	19	20.9	Cutting/piercing	30	11.2
Self-inflicted	38	10.6	Falls	12	13.2	Falls	27	10.1
						Motorcycle	27	10.1
All other causes	181	50.6	All other causes	30	33.0	All other causes	113	42.3
All causes	358	100.0	All causes	91	100.0	All causes	267	100.0

(Continued)

Table 3

Leading Causes of Injury Discharges from Berkshire Medical Center by Age Group and Sex (Continued)

Cause: Total	#	%	Cause: Female	#	%	Cause: Male	#	%
30-44 years:								
Falls	72	23.9	Falls	28	27.5	Falls	44	22.1
Motor-vehicle occupant	47	15.6	Self-inflicted	26	25.5	Motor-vehicle occupant	30	15.1
Self-inflicted	44	14.6	Motor-vehicle occupant	17	16.7	Cutting/piercing	21	10.6
All other causes	138	45.8	All other causes	31	30.4	All other causes	104	52.3
All causes	301	100.0	All causes	102	100.0	All causes	199	100.0
45-64 years:								
Falls	105	46.3	Falls	57	55.9	Falls	48	38.4
Motor-vehicle occupant	36	15.9	Motor-vehicle occupant	16	15.7	Motor-vehicle occupant	20	16.0
Self-inflicted	16	7.0	Self-inflicted	8	7.8	Self-inflicted	8	6.4
All other causes	70	30.8	All other causes	21	20.6	All other causes	49	39.2
All causes	227	100.0	All causes	102	100.0	All causes	125	100.0
65+ years:								
Falls	340	70.1	Falls	266	75.4	Falls	74	56.1
Motor-vehicle occupant	23	4.7	Motor-vehicle occupant	14	4.0	Motor-vehicle occupant	9	6.8
Adverse drug reaction	19	3.9	Overexertion	14	4.0	Adverse drug reaction	6	4.5
All other causes	103	21.2	All other causes	59	16.7	All other causes	43	32.6
All causes	485	100.0	All causes	353	100.0	All causes	132	100.0

Source: Massachusetts Rate Setting Commission, Uniform Hospital Discharge Data Set.

Note: Percents do not always total 100.0 due to rounding.

Appendix A

ICD-9-CM External Cause of Injury Categories

Motor Vehicle-Occupant

E810.0, E810.1, E811.0, E811.1,
E812.0, E812.1, E813.0, E813.1,
E814.0, E814.1, E815.0, E815.1,
E816.0, E816.1, E817.0, E817.1,
E818.0, E818.1, E819.0, E819.1,
E822.0, E822.1, E823.0, E823.1,
E824.0, E824.1, E825.0, E825.1,

Operator or passenger in motor vehicle

Includes: Collision and noncollision traffic and nontraffic accidents; driver or passenger of car, bus, truck, van, or construction machinery in transport under its own power; off-road motor vehicle operating on a public highway

Excludes: Occupant or passenger of bicycle, motorcycle, off-road vehicle not on highway, motorized bicycles; pedestrians

Motor Vehicle - Pedal Cycle Rider

E810.6, E811.6, E812.6, E813.6,
E814.6, E815.6, E816.6, E817.6,
E818.6, E819.6, E822.6, E823.6,
E824.6, E825.6

Any person riding on a pedal cycle involved in a collision or noncollision accident with a motor vehicle on a public highway

Includes: Accidents on and off public highways, e.g., parking lots, driveways

Motor Vehicle - Pedestrian

E810.7, E811.7, E812.7, E813.7,
E814.7, E815.7, E816.7, E817.7,
E818.7, E819.7, E822.7, E823.7,
E824.7, E825.7

Pedestrian injured in any collision or noncollision traffic or nontraffic accident involving a motor vehicle

Motorcyclist

E810.2, E810.3, E811.2, E811.3,
E812.2, E812.3, E813.2, E813.3,
E814.2, E814.3, E815.2, E815.3,
E816.2, E816.3, E817.2, E817.3,
E818.2, E818.3, E819.2, E819.3,
E822.2, E822.3, E823.2, E823.3,
E824.2, E824.3, E825.2, E825.3

Operator or passenger on motorcycle involved in collision or noncollision traffic or nontraffic accident involving a motor vehicle

Includes: Motorized bicycle (moped, scooter, tricycle); occupant of side car

Nonmotor Vehicle Pedal Cycle
E826.0-E826.9

Any person injured in a nonmotor vehicle accident involving a pedal cycle

Includes: Fall from bicycle; bicycle colliding with pedestrian, other bicycle, animal, object, or other road vehicle, e.g., streetcar

Excludes: Accidents involving motor vehicles, railroad trains, and aircraft

Off-Road Motor Vehicle
E820.0-E820.9, E821.0-E821.9

Nontraffic accidents involving motor vehicles designed to negotiate rough or soft terrain or snow

Includes: All-terrain vehicles (ATVs) and snowmobiles

Other Transport Accidents

E800.0-E807.9,
E810.4, E810.5, E810.8, E810.9,
E811.4, E811.5, E811.8, E811.9,
E812.4, E812.5, E812.8, E812.9,
E813.4, E813.5, E813.8, E813.9,
E814.4, E814.5, E814.8, E814.9,
E815.4, E815.5, E815.8, E815.9,
E816.4, E816.5, E816.8, E816.9,
E817.4, E817.5, E817.8, E817.9,
E818.4, E814.5, E818.8, E818.9,
E819.4, E819.5, E819.8, E819.9,
E822.4, E822.5, E822.8, E822.9,
E823.4, E823.5, E823.8, E823.9,
E824.4, E824.5, E824.8, E824.9,
E825.4, E825.5, E825.8, E825.9,
E827.0-E829.9, E831.0-E831.9,
E833.0-E838.9, E840.0-E845.9,
E846-E848

All other transport accidents

Includes: Motor vehicle traffic accidents involving other and unspecified person; any motor vehicle nontraffic accident involving any person; occupants of streetcars and animal riders; all railway accidents except those with motor vehicles; any person involved in any air or water transport vehicle accident; animal rider or rider of animal-drawn vehicle; motor vehicle nontraffic accident while boarding or alighting

SEE NOTE 1 (page 22)

Misadventure
E870.0-E876.9

Misadventures to patients during surgical and medical care

Excludes: Accidental overdose of drugs

Postoperative Complications

E878.0-E879.9

Surgical and medical procedures as the cause of abnormal reaction without mention of misadventure at the time of the procedure

Includes: Organ rejection, malfunction of devices, postoperative renal failure or intestinal obstruction

Excludes: Adverse reactions to anesthesia without mention of misadventure; infusion and transfusion reactions without mention of misadventure

Falls

E880.0-E886.9, E887, E888

Includes: Falls on same level (slipping, tripping); falls on different levels (stairs, bed, ladder); diving into swimming pool; tackles in sports

Excludes: Falls from horses in sports or transport; falls from burning buildings; falls from moving vehicles and bicycles; falls while boarding or leaving vehicles; falls onto sharp objects; falls into water

SEE NOTE 2 (page 22)

Environmental/Radiation

E900.0-E909, E926.0-E926.9,
E928.0-E928.8

Accidents due to natural and environmental factors

Includes: Excessive heat, cold, air pressure changes, travel and motion, hunger, thirst, exposure, neglect, venomous animals and plants, unspecified environmental, exposure to radiation

Excludes: Ingestion of poisonous animals or plants; plant puncture wounds, animal bites; road vehicle accidents involving animals

Drowning and Submersion (Accidental)

E830.0-E830.9, E832.0-E832.9,
E910.0-E910.9

Includes: Accidental drowning and submersion, swimmer's cramp, water sports, any falls or accidents involving watercraft

Excludes: Transport accidents other than watercraft; injuries due to diving into swimming pool and striking side or bottom; drowning as a result of a motor vehicle accident

**Fire, Flames and Hot Substances
(Burns and Scalds)**

E890.0-E899, E924.0-E924.9

Accidents caused by fire and flames; scalds; hot substances; objects; steam

Includes: Accidental burning by fire, secondary fires due to explosion; asphyxia due to fire; smoke and fumes due to fire; fall or jump from burning structure; ignition of clothing or bedclothes

Excludes: Fire in machinery in operation; transport vehicle except stationary; fire in other vehicle, e.g., ski lift; watercraft fires; intentional fires; electric current; radiation burns; internal burns

Poisonings (Accidental)

E850.0-E869.9

Accidental poisonings by drugs, medicinals, and biological substances

Includes: Solids, liquids, gases and vapors

Excludes:

1. administration with suicidal or homicidal intent or with intent not determined as accidental or purposeful
2. adverse reactions to correct drugs properly administered
3. food poisoning (bacterial)
4. poisoning and toxic reactions to plants
5. carbon monoxide poisoning from motor vehicle, watercraft, or aircraft in transit
6. carbon monoxide poisoning from smoke and fumes in fire

Suffocations (Accidental)
E911, E912, E913.0-E913.9

Inhalation and ingestion of food or object causing obstruction of respiratory passage or suffocation; accidental mechanical suffocation

Includes: Smothering, choking

Excludes: Intentional suffocations and those not determined as accidental or purposeful; any ingestion of a foreign body without mention of asphyxia or obstruction of respiratory passage

Foreign Body
E914-E915

Foreign body in the eye, adnexa, or other orifice

Includes: Injury to respiratory tract without obstruction or asphyxia

Excludes: Corrosive liquids in eye

Struck by Object
E916, E917.0-E917.9, E918

Struck by falling object, striking against or struck by persons or objects, caught accidentally between objects

Excludes: Striking against object or persons with fall; accident involving machinery or motor vehicle in operation; assault; cutting or piercing instrument; accident resulting in drowning or submersion

Machinery In Operation
E919.0-E919.9

Accident caused by machinery in operation

Cutting/Piercing
E920.0-E920.9

Accident caused by cutting or piercing instrument or object

Includes: Fall on sharp object; accident caused by powered or nonpowered hand tools or appliances

Explosion/Firearms (Accidental)

E921.0-E921.9, E922.0-E922.9,
E923.0-E923.9

Accident caused by firearms, explosion of pressure vessel or explosive material; fireworks

Excludes: intentional firearms and those not determined as accidental or purposeful; explosions due to or causing fire, machine explosions, explosions in transport vehicles or machinery in operation; air rifles and BB guns

SEE NOTE 3 (page 22)

Electricity

E925.0-E925.9

Accident caused by electrical currents

Overexertion

E927

Overexertion and strenuous movements from excessive physical exercise, recreation, lifting, pulling, pushing

Unspecified

E928.9

Accident unspecified

Late Effects

E929.0-E929.9, E959, E969,
E977, E989, E999

Late effects of accidents, assaults, injury undetermined as accidental or purposeful, legal intervention, suicide, war operations

Adverse Drug Reaction

E930.0-E949.9

Drugs, medicinal and biological substances causing adverse effects in therapeutic use

Includes: Correct drug properly administered in therapeutic or prophylactic dosage as the cause of any adverse effect

Suicide and Self-Inflicted

E950.0-E953.9, E954,
E955.0-E955.9, E956,
E957.0-E958.9

Suicide and self-inflicted injuries

Includes: Suicide, attempted suicide, and intentional self-inflicted injuries

Homicide and Purposely Inflicted by Other

E960.0-E962.9, E963-E964,
E965.0-E965.9, E966,
E967.0-E968.9

Injuries inflicted by another person with intent to injure or kill, by any means

Includes: Child battering, rape

Legal Intervention

E970-E976, E978

Injuries inflicted by the police or other law enforcement agents on duty; includes legal execution by any method

Undetermined Intent

E980.0-E988.9

Injury undetermined whether accidentally or purposely inflicted

Includes: Self-inflicted injuries but not poisoning by corrosive and caustic substances

Wars

E990.0-E998

Injuries resulting from operations of war

Includes: Injuries to military personnel and civilians caused by and occurring during war and civil insurrections

Excludes: Training accidents

NOTES:

1. E-code entries in the E810-E819 and E822-E825 ranges that end in .8 and .9 refer to "other" and "unspecified" injury victims, respectively. Often, these are injuries to motor vehicle occupants, and some researchers classify them as such. We have elected not to do so because of the possible introduction of bias into the data. This practice will overestimate the importance of occupant injury, and underestimate the problem of pedestrian, bicycle and motorcycle injuries.
2. Fracture, cause unspecified (E887), has been included as a fall although it could have a different cause.
3. **Firearms** may be of special interest and appear in several categories. If examining firearms as a separate category, the grouping would be as follows:
E922.0-E922.9, E955.0-E955.4, Accidental; self-inflicted;
E965.0-E965.4, E970, assault; legal intervention
E985.0-E985.4, E991.2 and war operations;
undetermined if accidental or purposeful
Includes: Firearm injury due to legal
intervention and war operations
Excludes: Air rifles, BB guns

Appendix B

ICD-9-CM Nature of Injury Diagnostic Categories

<u>Diagnostic Category</u>	<u>Codes</u>
Skull Fracture	800-801.99, 803-804.99
Concussion	850-850.99
Facial Fracture	802-802.5, 802.8-802.9
Intracranial Non-Fracture	851-854.19
Neck Trunk Fracture	805-805.98, 807-809.1
Vertebral Fracture with SCI*	806-806.9
Upper Limb Fracture	810-819.1
Femur Fracture	820-821.39
Lower Limb Fracture	822-829.1
Dislocations	830-839.9
Sprains and Strains	840-848.9
Internal Injuries	860-869.1
Eye Injuries	802.6-802.7, 870-871.9, 900.03, 918.0-918.9, 921.0-921.9, 930.0-930.9, 940.0-940.9, 941.02, 941.12, 941.22, 941.32, 941.42, 941.52, 950-950.9, 951.0-951.1, 951.3
Open Wounds	872-884.2, 890-894.2
Traumatic Amputation	885-887.7, 895-897.7
Blood Vessel Injury	900-900.02, 900.1-904.9
Superficial Injury	910-917.9, 919-919.9
Contusions	920, 922-924.9
Crushing	925-929.9
Foreign Body in Orifice	931-939.9
Burns	941-941.01, 941.03-941.11, 941.13-941.21, 941.23-941.31, 941.33-941.41, 941.43-941.51, 941.53-949.5
Nerve Injury	951.2, 951.4-957.9
Poisoning and Toxic Effects	960-989.9
Late Effects	905-909.9
Traumatic Complications/Unspecified	958-959.9
Complications of Care	996-999.9
Other and Unspecified	990-995.9

* Spinal Cord Injury

